ELSEVIER Case Report

Littoral Cell Angioma of the Spleen

Ya-Jun Wang, Fei Li, Feng Cao, Jia-Bang Sun, Jia-Feng Liu and Yue-Hua Wang, Department of General Surgery, Xuanwu Hospital of Capital Medical University, Beijing, China.

Littoral cell angioma (LCA) is a rare primary benign vascular neoplasm of the spleen. The case of a 52-year-old female with LCA is reported. The patient did not have any symptoms or a significant past medical history. Computed tomography (CT) and ultrasound (US) imaging studies showed multiple lesions in the spleen and gallbladder stones. The tumour was removed successfully by laparoscopic splenectomy and simultaneously cholecystectomy was conducted for gallbladder stones. The patient recovered uneventfully. The tumour lining cells were positive for CD31/CD68 markers, and negative for CD34. This is the first report of a LCA combined with gallbladder stones. [*Asian J Surg* 2009;32(3):167–71]

Key Words: littoral cell angioma, splenic tumour

Introduction

Littoral cell angioma (LCA) is a rare primary vascular neoplasm of the spleen, as first described by Falk et al in 1991.[1] Considered a benign condition, LCA arises from the normal littoral cells lining the sinus channels of the splenic red pulp. We present a 52-year-old female with pathologically proven LCA, studied by computed tomography (CT) and ultrasonography (US).

Case Report

The patient was a 52-year-old Chinese lady who came to our hospital for a routine health examination 2 years previously. Multiple solid nodules with a diameter about 0.5 cm in the spleen, and gallbladder stones were detected by abdominal ultrasound (US), and the size of the spleen was normal. Because there were no symptoms, she refused a further CT scan or therapy. The splenic nodules had enlarged in the next follow-up 2 years later, so she agreed to have surgery. Physical examination had no positive findings such as splenomegaly. The laboratory data was unremarkable: haemoglobin (144 g/L); white blood cell (WBC) count (7.2×10^9/L); and platelet count (126×10^9/L). A bone marrow trephine biopsy showed normal bone structure. The appearance on ultrasonography was isoechoic to hyperechoic multiple nodules ranging from 1.0 cm to 4.3 cm (Figute 1). The abdominal CT images revealed a spleen which measured 10.5 cm × 10.0 cm × 3.5 cm in size. In the precontrast study, multiple low-attenuating

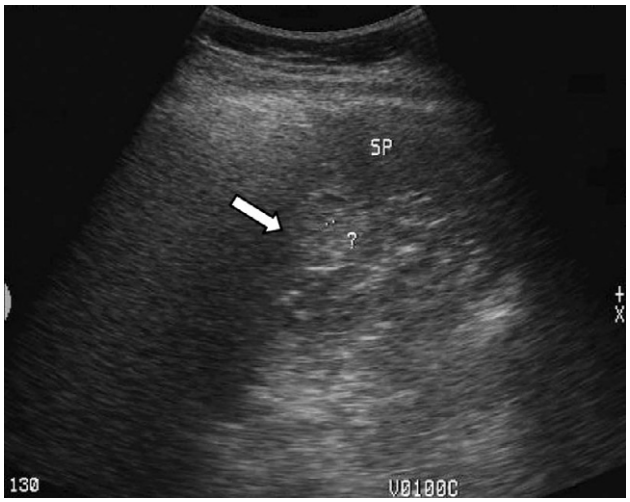

Figure 1. Abdominal ultrasonography showed an echotexture spleen with hyperechoic lesions (arrowhead).

Address correspondence and reprint requests to Dr Ya-Jun Wang, Department of General Surgery, Xuanwu Hospital of Capital Medical University, 45 Changchun Street, Beijing 100053, China.
E-mail: puwaiyajun@yahoo.cn • Date of acceptance: 13 March 2009

Figure 2. An axial pre-contrast CT scan showed multiple heterogeneous hypodense nodules in the spleen.

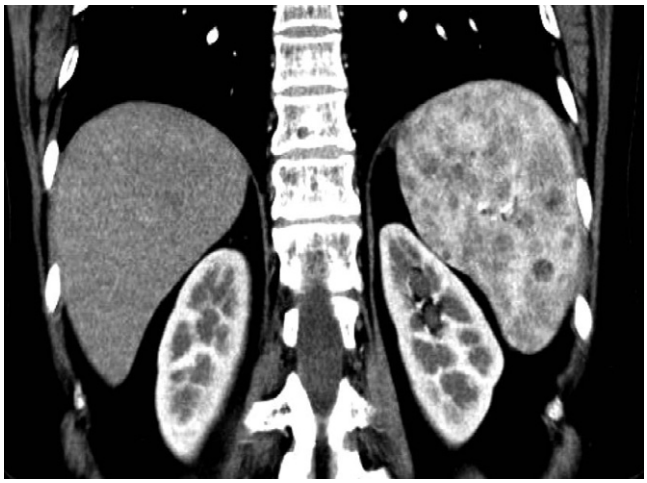

Figure 3. Coronal contrast-enhanced CT images at multiple well-defined, section showed with a diameter of about 2.0 cm.

nodular lesions were present throughout the spleen with a CT value of 66 HU (Figure 2). The post-enhanced CT images at the artery phase revealed multiple well-defined, heterogeneously hypoattenuating lesions with partial areas of enhancement that measured several millimeters to 1.2 cm in diameter. The CT value for these was 97 HU (Figure 3). As the underlying nature of the lesion could not be determined in this patient, laparoscopic splenectomy and cholecystectomy was undertaken. The spleen measured 10.0 cm × 10.0 cm × 3.0 cm, and a cut section showed multiple brownish-red nodules with a diameter of about 2.0 cm (Figure 4). Microscopically, the lesions consisted of anastomosing vascular channels, with papillary projections and cyst-like spaces. The cells lining the vascular spaces were tall, plump, and bland looking with few mitotic figures and no cytologic nuclear atypia.

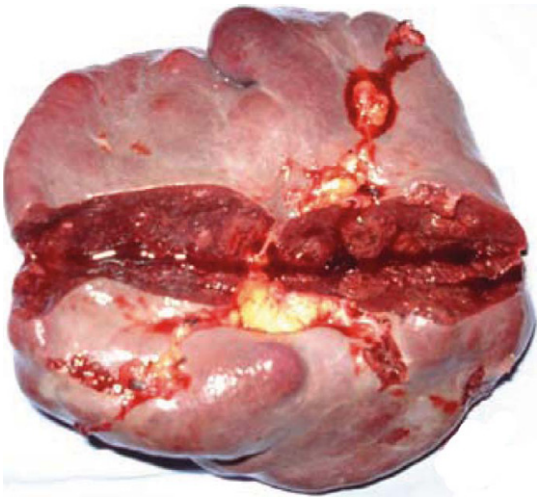

Figure 4. The spleen measured 10 × 10 × 3 cm and the cut artery phase showed multiple brownish-red nodules with heterogeneously hypoattenuating lesions.

Marked haemosiderin pigmentation was identified in the patient (Figure 5A and 5B). The tumour demonstrated immunoreactivity with endothelial markers (factor VIII, CD31) and histiocytic markers (CD68, lysozyme) (Figure 6A and 6B), but negatively for CD34 (Figure 7) that is normally present on red pulp sinusoidal endothelium. This confirmed the diagnosis of LCA. As the platelet count had risen to 741×10^9/L on day 6 after surgery, anti-coagulation therapy was given. The patient was discharged from the hospital on the 7th day and very healthy at the 1 year follow-up.

Discussion

The most commom primary tumours of the spleen are vascular in origin. Most are benign and include haemangiomas and harmatoms. More recently, a distinct splenic vascular tumour with specific immunohistochemical properties has been described.[1] Because of the limited cases, the aetiology and nature history of LCA is not clear. About 33% of LCA has an association with malignancy, including lymphoma, colorectal adenocarcinoma, lung adenocarcinoma, littoral cell angiosarcoma, haemangioendothelioma, pancreatic adenocarcinoma, renal cell carcinoma, melanoma, leukemia, testicular seminoma, and papillary thyroid carcinoma. Additionally, 17% were associated with immunologic or congenital disorders such as Crohn's disease, Wiskott-Aldrich syndrome, Epstein syndrome, lymphocytic colitis, ankylosing spondylitis, Gaucher's disease, myelodysplastic syndrome, chronic

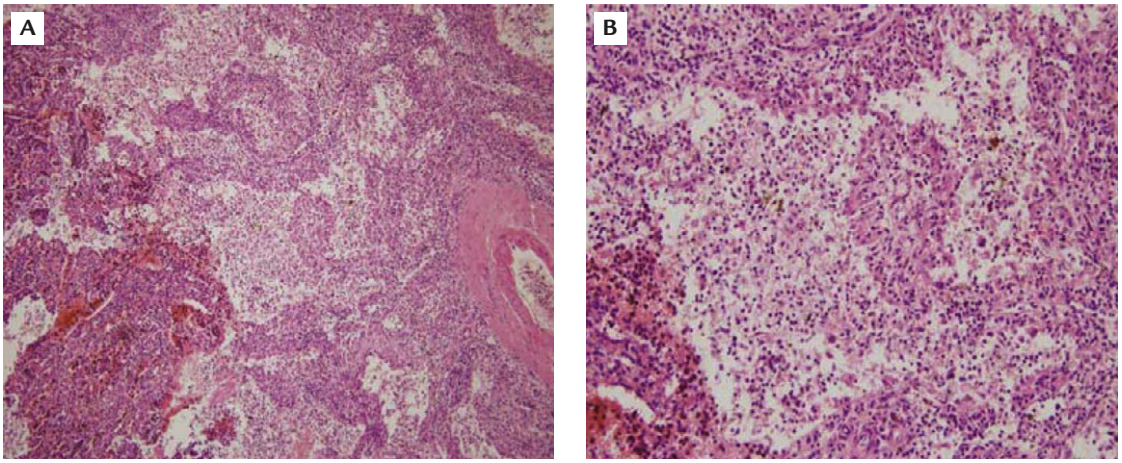

Figure 5. (Haematoxylin & eosin, (A) 100×, (B) 200×) The lesions consisted of anastomosing vascular channels, with papillary projections and cyst-like spaces. The cells lining the vascular spaces are tall, plump, and bland looking with few mitotic figures and no cytologic nuclear atypia. Marked haemosiderin pigmentation was identified.

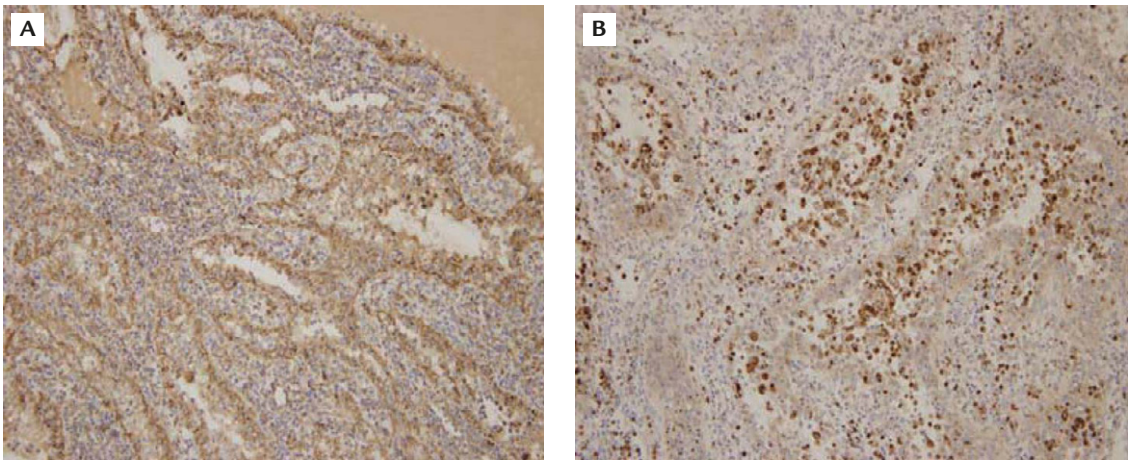

Figure 6. Immunohistochemical stains reveal positive immunoreactivity to both the endothelial marker factor CD31 (A) and the histiocytic marker CD68 (B).

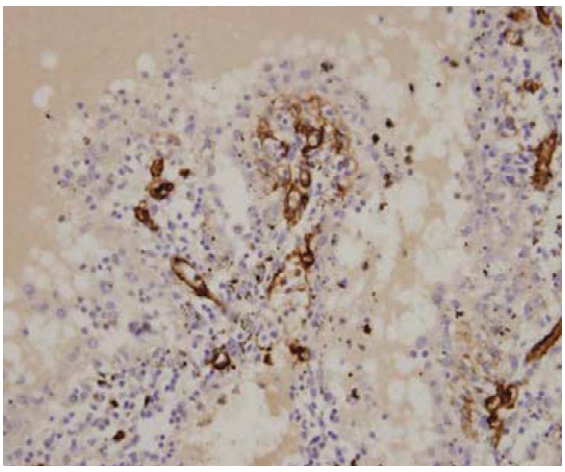

Figure 7. Immunohistochemical stains reveal negative immunoreactivity to CD34.

glomerulonephritis, and aplastic anaemia. So there may be some relationship between LCA and malignancy, chronic infection or autoimmune diseases.[2] LCA usually presents with abdominal pain, low fever, fatigue, splenomegaly and hypersplenism, but some have no clinical manifestation, or even splenomegaly.

In this patient, LCA was detected by ultrasonography when she took a routine clinical examination. Generally, there are two types of LCA according to the imaging findings. The most frequent type is seen as a tumour including multiple lesions involving the entire spleen. The second type is rare and presents as a solitary lesion. To our knowledge, there have been more than 60 cases with imaging findings of LCA reported in English language literature

since the description of the disease in 1991, but there are only four cases with a solitary lesion.[3–6] There were no significant differences between the two types in sign and symptoms. About one third of cases were associated with cancers of visceral organs or malignant lymphomas, but it is still unclear which type of LCA occurs more frequently because of the limited case numbers and follow-up time. Our patient presented as multiple lesions and had no malignancy, chronic infection or autoimmune diseases.

The imaging feature of LCA is nonspecific. The sonographic appearance of splenic LCA is variable, including mottled echotexture without discrete lesions, and isoechoic, hypoechoic, and hyperechoic nodules. CT features of LCA have been well described, with most being isoattenuating to slightly hypoattenuating on noncontrast examinations. Contrast enhancement reveals early hypoattenuation on arterial and most early portal phase scans. There is heterogeneous to homogeneous enhancement on the late portal phase and delayed images. Some delayed scans have described a complete contrast washout with return to isoattenuation. The MRI characteristics of LCA appear to depend on the amount of siderosis within the tumour. If there is significant siderosis, then there is markedly low signal intensity on all sequences due to haemosiderin deposition. Unfortunately, this very helpful and fairly specific imaging characteristic was present only in a few of cases. In most, the T1 signal was isointense to slightly hypointense and the T2 signal was hyperintense to the splenic parenchyma. Schneider et al reported that the decreased T2 signal after superparamagnetic iron oxide administration indicated the increased phagocytic reticuloendothelial properties of the LCA tumour. This feature of LCA appears specific among primary splenic tumours. A Tc99m-RBC scan could be a potentially helpful means in adding specificity to the imaging of LCA. Given that both haemangioma and angiosarcoma are "hot" on the RBC scan, the photopenic or "cold" focus corresponding to the LCA seems to be a differentiating imaging feature.[7]

The differential diagnosis for multiple splenic lesions includes many neoplastic and nonneoplastic disorders. The other primary vascular tumours, such as a haemangioma, harmatoma, haemangiopericytoma, haemangioendothelioma or angiosarcoma should be first taken into consideration, and other lesions including lymphoma, lymphangioma, visceral metastasis, a splenic abscess, and granulomatous diseases such as sarcoidosis and tuberculosis should also be regarded.[8,9]

The gross histologic and immunohistochemical characteristics of LCA have been well described. The gross anatomic description usually involves multiple spongy red-brown nodules that are blood-filled. The lesion histology demonstrated branching vascular channels with various-sized cavernous spaces replacing the red pulp. The cavernous spaces were filled with red blood cells and sloughed tumour cells. High-field magnification revealed tall and plump sinus-lining cells with little mitosis and no cytologic nuclear atypia to suggest malignancy. Marked haemosiderin pigmentation usually found in cytoplasma which commonly contains abundant cytoplasmic eosinophilic globules. The vascular channels in LCA have been called organoid, as opposed to the haphazard growth pattern of the anastomosing vessels in angiosarcoma.[3] Immunohistochemical staining is specific, as the tumour demonstrates immunoreactivity with endothelial markers (factor VIII, CD31) and histiocytic markers (CD68, lysozyme, CD21), which demonstrate the tumour's dual histiocytic/endothelial differentiation. The splenic sinus-lining marker CD8 is considered to be a marker of LCA, but LCA is not normally reactive with it, so the origin of LCA should undergo further research. The most efficient way to diagnose LCA is image-guided percutaneous biopsy which conventionally thought to be dangerous due to an assumed high risk of severe complications.[10]

LCA tends to be a benign tumour, which can be cured by laparoscopic[11] or laparotomy splenectomy. As it can be coexist with many malignancies, and some reported that in 4 and 8 years after splenectomy, liver metastasis, retroperitoneal metastasis and abdominal masses were found in some patients,[12,13] indicating that a long term follow-up is strictly needed.

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